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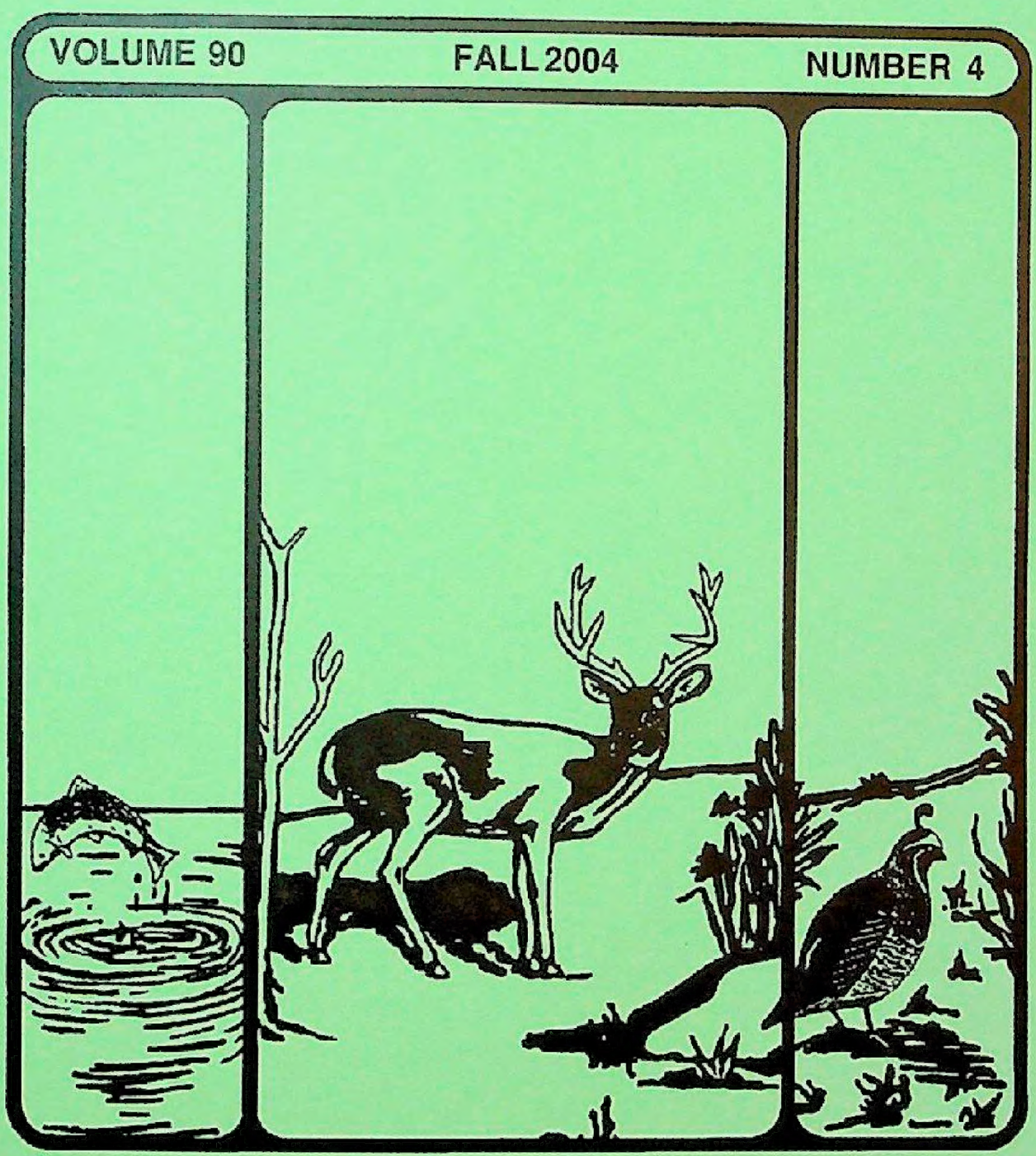

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AN ANNOTATED CHECK LIST OF THE AMPHIBIANS AND REPTILES OF CALIFORNIA AND ADJACENT WATERS

(Third, revised edition)

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This represents a comprehensive check list of the present status of all known marine, freshwater, and terrestrial amphibians and reptiles that have been reliably reported as part of the California fauna. Included is a main list of native and established introduced species and four supplementary lists: (1) native species extinct in California, (2) distributionally or taxonomically invalid species, (3) established introduced species, and (4) introduced species unsuccessfully established or of questionable status. The main list is composed of 159 species, comprising 144 native freshwater and terrestrial species (includes 2 species which have subspecies or populations from introductions originating outside the state), 5 native marine species, and 12 introduced species. The 159 species comprise 33 families and 69 genera.

INTRODUCTION

Previously published comprehensive listings of the California herpetofauna include: Croinse (1868), Cooper (1870), Van Denburgh (1897, 1922), Grinnell and Camp (1917), Storer (1925), Slevin (1928, 1934), Smith (1946), Wright and Wright (1952), Stebbins (1972), Laudenslayer and Grenfell (1983), Laudenslayer et al. (1991), and Brown (1997), with additional regional lists by numerous authors, both in peer-reviewed published journals (e.g., see the listing in Moriarty and Bauer 2000) and privately compiled electronic formats. Jennings (1983, 1987) provided the most recent check lists of amphibians and reptiles (to the subspecies level) inhabiting the State. Since then, however, there have been a number of substantive changes in the herpetofauna, its nomenclature, and the status of many species and subspecies. This paper is an attempt to enumerate in a single document information on the present status of all marine, freshwater, and terrestrial species that have been reliably reported as part of the California fauna.

[1] Research Associate.

SCOPE

The main list covers both native and successfully established introduced species. The supplementary lists include: (i) native species believed to be extinct in California, (ii) distributionally or taxonomically invalid species, (iii) established introduced species, and (iv) introduced species unsuccessfully established or of questionable status.

Continued attempts have been made to include all native forms whose occurrence has been reported and not disproved in the literature, or by documented evidence such as museum records and photographs. Most of these species and subspecies are known to have breeding populations in the State. However, there are a few exceptions. None of the marine reptiles are known to reproduce in California[2], but since they occasionally enter State waters, they are included in the main list. Such criteria allow the inclusion of the sea snake, *Pelamis platurus*, which has been reported several times in southern California waters (Kropach 1975, Pickwell et al. 1983).

There is the distinct possibility that some native species are no longer part of the California fauna. One such native form that appears to be extinct is the Sonoran mud turtle, *Kinosternon sonoriense*. Since it is virtually impossible to prove or disprove its absence, however, this turtle is still included in the main list. On the other hand, only those introduced species which are known to have successfully reproducing populations in the State are included.

I have not included records of transplants of native species within the State. There have been several attempts to expand the range of indigenous species. Some examples include *Rana draytonii* released on Santa Cruz Island (Storer 1933, Jennings 1988a), *Phrynosoma coronatum blainvillii* introduced on San Clemente Island (Mearns 1907), and *Thamnophis sirtalis tetrataenia* liberated in Point Reyes National Seashore (Barry 1978).

For the purposes of this paper, the definition of the State includes the entire Colorado River where it forms the California boundary, and the Pacific Ocean within 805 km of any point of land in the State between the seaward projections of its northern and southern boundaries. The westward limit coincides roughly with the outer edge of the California Current (Hubbs et al. 1979).

The status of protected, endangered, threatened, and rare species, along with species of special concern, is based on information presented by Stewart (1971), Bury (1972), Fisk (1972), Bury and Stewart (1973), Ashton (1976), Mallette and Nicola (1980), Drewry (1991), Jennings and Hayes (1994a), Jennings (1996), California Department of Fish and Game (2004), and the California Administrative Code (2004). The status of introduced species is determined by information presented by Stebbins (1966, 1972, 1985, 2003), Bury and Luckenbach (1976), Smith and Kohler (1977), unpublished field notes housed in the collections of the California Academy of Sciences and the Museum of Vertebrate Zoology (University of California at Berkeley), personal communications

[2] There are at least two observations of hatchling sea turtles seen on the beach or in the surf north of Scripps in the late 1960s and 1980. It is unknown if these are the result of successful nesting attempts by sea turtles in southern California.

with various authorities, and other papers cited in the text. In keeping with the terminology used by Shafland and Lewis (1984), introduced species are organisms moved from one place to another by human actions.

Hybrids have been omitted. Interspecific and intergeneric hybrids of a number of species listed (e.g., *Ambystoma californiense* x *A. tigrinum* spp., *Gambelia sila* x *G. wislizenii*, and *Thamnophis couchii* x *T. hammondii*) have been recorded from California (Montanucci 1970, Rossman and Stewart 1987, Long 1992). I have also omitted intergrades between subspecies such as found in the salamanders of the genus *Ensatina* (Brown 1974, Wake and Yanev 1986, Wake et al. 1986, Jackman and Wake 1994, Wake 1997, Wake and Schneider 1998).

I have decided to include several taxa of amphibians and reptiles in the main list that remain to be formally described in the scientific literature. The rationale for including these amphibians is due to their appearing in other published works (e.g., Stebbins 1985, 2003; Macey and Papenfuss 1991; Jennings and Hayes 1994a; Jennings 1996; Petranka 1998), and the importance of conserving unique, isolated, elements of our native herpetofauna.

NAMES

As mentioned in previous check lists, uniformity in the usage of scientific and common names continues to be a never-to-be attained goal (Shapovalov et al. 1981). This is due, in part, to our increasing knowledge of the relationships of amphibians and reptiles at the family, generic, and species levels. New techniques and discoveries, along with an increase in the number of workers, have contributed to nomenclatural changes. This is especially true with such difficult groups as *Ambystoma*, *Batrachoseps*, *Ensatina*, *Crotaphytus*, *Gambelia*, and *Thamnophis*, which sometimes seem to defy systematic resolution.

In preparing this list, care has been taken to follow a standard set of rules and not add to the nomenclatural confusion. Higher classification follows that employed by Frost (1985), Petranka (1998), Pough et al. (2001), and Zug et al. (2001) with few exceptions. Genus and species names used conform to the provisions of the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999) and published rulings by the International Commission on Zoological Nomenclature [ICZN]. Common names, however, have proven to be an ever greater source of controversy. The previous authoritative list of common names for amphibians and reptiles (Conant et al. 1956) was an outgrowth of Schmidt's (1953) check list. Accepted by most herpetologists, this list served as the basis for the common names utilized by Conant (1958, 1975) and Stebbins (1966, 1985) in their field guides. Unfortunately, the list remained unrevised over the years except for a quick update by Dowling (1974) who did not include subspecies. Collins et al. (1978, 1982), Collins (1990, 1997), and Collins and Taggart (2002), attempted to revise this list in depth, but their disregard of the criteria they proposed in adopting common and scientific names, along with many other inconsistencies in taxonomy and spellings, has resulted in their lists being largely ignored as the definitive work for North American

amphibian and reptile nomenclature (see Crother et al. 2000). Because of these problems, I have elected to utilize the common names of Conant et al. (1956), Stebbins (1985, 2003), Banks et al. (1987), and Crother et al. (2000, 2003), except for those species and subspecies that are of uncertain status. In these cases, the original published descriptions (or revisions), or the accounts contained in the Catalogue of American Amphibians and Reptiles (American Society of Ichthyologists and Herpetologists 1963-1970; Society for the Study of Amphibians and Reptiles 1970-present), are utilized as the final authority. These exceptions are mentioned in the text.

In regard to the spelling of scientific patronyms emended to represent a man's name (such as *Batrachoseps campi*, *Ensatina eschscholtzii*, *Rana boylii*, *Gopherus agassizii*, *Eumeces gilberti*, *Phrynosoma douglasii*, *Rhinocheilus lecontei*, *Thamnophis couchii*, etc.), I choose to use the original spellings (either single or double *-i* endings) as stipulated by the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999). This nomenclatural enigma, and its surrounding controversy, is amply treated by Jennings (1982), Smith (1983), and Dundee and Smith (1989).

CHECK LIST
Native Species and Established Introduced Species

This list consists of 159 full species, which may be subdivided as follows: 149 native species (5 of which are marine and 2 of which have subspecies or populations from introductions originating outside the state) and 12 established introduced species.

Species which have been introduced into California are denoted by an asterisk (*), marine reptiles by an "O", and extinct species by a dagger (†). The following symbols are used to denote current status:

SE: State-listed endangered species.
ST: State-listed threatened species.
SP: State-listed protected species.
SC: Species of special concern in the State. (Those animals which may become listed as threatened, endangered, or protected species in the near future due to habitat modification or destruction, over collecting, disease, or threatened in any way by exotic species).
FE: Federally listed endangered species.
FT: Federally listed threatened species.
FP: Species protected by other federal laws (principally those relating to National Parks and Monuments).
N: No status. Species relatively common, or of widespread distribution in the State, or not currently under threat of extinction.
r: Species of very limited distribution only in California. Common in adjoining states or Mexico.

Native and Established Introduced Species.

Order Caudata—Salamanders.

Family AMBYSTOMATIDAE—Mole Salamanders and Relatives.

1. *Ambystoma californiense* Gray. California tiger salamander[3].....SC,SP,FE[4]
2. *Ambystoma gracile* (Baird). northwestern salamander.....N
3. *Ambystoma macrodactylum* Baird. long-toed salamander.
   3a. *Ambystoma macrodactylum croceum* Russell and Anderson. Santa Cruz long-toed salamander.....SE,SP,FE
   3b. *Ambystoma macrodactylum sigillatum* Ferguson. southern long-toed salamander.....N
4. *Ambystoma tigrinum* (Green). tiger salamander*[5].
   4a. *Ambystoma tigrinum melanostictum* (Baird). blotched tiger salamander. .....r
   4b. *Ambystoma tigrinum tigrinum* (Green). eastern tiger salamander*.....N
   4c. *Ambystoma tigrinum nebulosum* Hallowell. Arizona tiger salamander*.....N
   4d. *Ambystoma tigrinum mavortium* Baird. barred tiger salamander*.....N

Family DICAMPTODONTIDAE—Giant Salamanders[6].

5. *Dicamptodon ensatus* (Eschscholtz). California giant salamander.....N
6. *Dicamptodon tenebrosus* (Baird and Girard). Pacific giant salamander.....N

Family RHYACOTRITONIDAE—Seep Salamanders[7].

7. *Rhyacotriton variegatus* Stebbins and Lowe. southern seep salamander.....SC,SP

Family SALAMANDRIDAE—Newts.

8. *Taricha granulosa* (Skilton). rough-skinned newt.
   8a. *Taricha granulosa granulosa* (Skilton). northern rough-skinned newt.....N

---

[3] Taxonomy after Shaffer and McKnight (1996).

[4] Only populations in Santa Barbara and Sonoma counties are federally listed (see McLaughlin et al. 2000 and Wooten 2003), although there is a proposed rule to list the species statewide (U.S. Fish and Wildlife Service 2003).

[5] Taxonomy after Shaffer and McKnight (1996). Only the population of *Ambystoma tigrinum melanostictum* at Grass Lake in Siskiyou County appears to be native (Shaffer and McKnight 1996). The rest of the *A. tigrinum* spp. populations in the state appear to be introduced (Jennings 1996; H. B. Shaffer, personal communication).

[6] Taxonomy after Good (1989).

[7] Taxonomy after Good and Wake (1992). I use the alternative vernacular name of "seep salamander" following Jennings and Hayes (1994a). This name appropriately implies (to an American audience) the kind of habitats this salamander is often observed in. The name "torrent" is more appropriate for audiences from the Old World where the term often refers to aquatic habitats that an American might call a "brook".

9. *Taricha rivularis* (Twitty). red-bellied newt.....N
10. *Taricha torosa* (Rathke, *in* Eschscholtz). California newt[8].
    10a. *Taricha torosa torosa* (Rathke, *in* Eschscholtz). Coast Range newt....SC[9],N
    10b. *Taricha torosa sierrae* (Twitty). Sierra newt.....N

Family PLETHODONTIDAE—Lungless Salamanders.

11. *Aneides ferreus* Cope. clouded salamander[10].....r
12. *Aneides flavipunctatus* (Strauch). black salamander[11].....N
13. *Aneides lugubris* (Hallowell). arboreal salamander.....N
14. *Aneides vagrans* Wake and Jackman, *in* Jackman. wandering salamander[12].....N
15. *Batrachoseps attenuatus* (Eschscholtz). California slender salamander.....N
16. *Batrachoseps campi* Marlow, Brode, and Wake. Inyo Mountains salamander...SC,SP
17. *Batrachoseps diabolicus* Jockusch, Wake, and Yanev. Hell Hollow slender salamander[13].....N
18. *Batrachoseps gabrieli* Wake. San Gabriel Mountains slender salamander[14].....N
19. *Batrachoseps gavilanensis* Jockusch, Yanev, and Wake. Gabilan Mountains slender salamander[15].....N
20. *Batrachoseps gregarius* Jockusch, Wake, and Yanev. gregarius slender salamander[16].....N
21. *Batrachoseps incognitus* Jockusch, Yanev, and Wake. San Simeon slender salamander[17].....N
22. *Batrachoseps kawia* Jockusch, Wake, and Yanev. Sequoia slender salamander[18].....N
23. *Batrachoseps luciae* Jockusch, Yanev, and Wake. Santa Lucia Mountains slender salamander[19].....N

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[8] Taxonomy after Tan and Wake (1995) who suggest that what we currently refer to as *Taricha torosa torosa* and *T. t. sierrae*, probably includes 2 separate taxa for the former and 3 for the latter.

[9] Only the newt populations from San Luis Obispo County south are classified as a Species of Special Concern (Jennings and Hayes 1994a).

[10] Taxonomy after Jackman (1998).

[11] Taxonomy after Lynch (1981) who did not recognize the two subspecies described by Myers and Maslin (1948).

[12] Taxonomy after Jackman (1998).

[13] Taxonomy after Jockusch et al. (1998).

[14] Taxonomy after Wake (1996).

[15] Taxonomy after Jockusch et al. (2001).

[16] Taxonomy after Jockusch et al. (1998).

[17] Taxonomy after Jockusch et al. (2001).

[18] Taxonomy after Jockusch et al. (1998).

[19] Taxonomy after Jockusch et al. (2001). Henson et al. (1993) inappropriately applied a subspecies name of the Pacific slender salamander to this salamander following Yanev (1978). The manuscript subspecific name as proposed by Yanev (1978) in her dissertation, was formally described and published in Jockusch et al. (2001).

24. *Batrachoseps major* Camp. garden slender salamander[20].
    24a. *Batrachoseps major major* Camp. garden slender salamander.....N
    24b. *Batrachoseps major aridus* Brame. desert slender salamander.....SE,FE
25. *Batrachoseps minor* Jockusch, Yanev, and Wake. lesser slender salamander[21]...N
26. *Batrachoseps nigriventris* Cope. black-bellied slender salamander.....N
27. *Batrachoseps pacificus* (Cope). Channel Islands slender salamander[22].....FP
28. *Batrachoseps regius* Jockusch, Wake, and Yanev. Kings River slender salamander[23].....N
29. *Batrachoseps relictus* Brame and Murray. relictual slender salamander[24].....SC
30. *Batrachoseps robustus* Wake, Yanev, and Hansen. Kern Plateau salamander[25]...N
31. *Batrachoseps simatus* Brame and Murray. Kern Canyon slender salamander.....ST
32. *Batrachoseps* sp. Breckenridge Mountain slender salamander†[26].....SC
33. *Batrachoseps* sp. Fairview slender salamander[27].....N
34. *Batrachoseps stebbinsi* Brame and Murray. Tehachapi slender salamander.....ST
35. *Ensatina eschscholtzii* Gray. ensatina[28].
    35a. *Ensatina eschscholtzii eschscholtzii* Gray. Monterey ensatina.....N
    35b. *Ensatina eschscholtzii croceater* (Cope). yellow-blotched ensatina.....SC
    35c. *Ensatina eschscholtzii klauberi* Dunn. large-blotched ensatina.....SC
    35d. *Ensatina eschscholtzii oregonensis* (Girard). Oregon ensatina.....N
    35e. *Ensatina eschscholtzii picta* Wood. painted ensatina.....N
    35f. *Ensatina eschscholtzii platensis* (Espada). Sierra Nevada ensatina.....N
    35g. *Ensatina eschscholtzii xanthoptica* Stebbins. yellow-eyed ensatina.....N
36. *Hydromantes brunus* Gorman. limestone salamander[29].....ST,SP
37. *Hydromantes platycephalus* (Camp). Mount Lyell salamander[30].....SC,SP
38. *Hydromantes shastae* Gorman and Camp. Shasta salamander.....ST

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[20] Taxonomy after Wake and Jockusch (2000).

[21] Taxonomy after Jockusch et al. (2001).

[22] Taxonomy after Jockusch et al. (1998) and Wake and Jockusch (2000).

[23] Taxonomy after Jockusch et al. (1998).

[24] Ibid.

[25] Taxonomy after Wake et al. (2002).

[26] Listed and discussed in Stebbins (1985), Jennings and Hayes (1994a) and Jennings (1996).

[27] Listed in Stebbins (1985) and Jennings (1996).

[28] Taxonomy following Wake (1997) and Wake and Schneider (1998).

[29] *Hydromantes* is the correct genus name for all web-toed salamanders in North America based on Opinion 1866 of the ICZN (International Commission on Zoological Nomenclature 1997).

[30] Macey and Papenfuss (1991) mention an undescribed species of *Hydromantes* from the Owens Valley. The "Owens Valley Web-toed salamander" was since reported upon by Jennings and Hayes (1994a) and was listed as a Species of Special Concern by the California Department of Fish and Game. More widespread sampling of salamanders and recent biochemical work indicates that the *Hydromantes* from the eastern Sierra Nevada are not sufficiently distinct from currently known *H. platycephalus* populations to warrant a formal species description in the scientific literature (D. B. Wake, personal communication).

39. *Plethodon dunni* Bishop. Dunn's salamander.....r[31]
40. *Plethodon elongatus* Van Denburgh. Del Norte salamander.....SC,SP
41. *Plethodon stormi* Highton and Brame. Siskiyou Mountains salamander[32].....ST

Order Anura—Toads and Frogs.
Family ASCAPHIDAE—Tailed Frogs.

42. *Ascaphus truei* Stejneger. coastal tailed frog[33].....SC,SP

Family PELOBATIDAE—Spadefoot Toads[34].

43. *Scaphiopus couchii* Baird. Couch's spadefoot.....SC,r[35]
44. *Spea hammondii* Baird. western spadefoot.....SC,SP
45. *Spea intermontana* Cope. Great Basin spadefoot.....N

Family PIPIDAE—Tongueless Frogs.

46. *Xenopus laevis* (Daudin). African clawed frog*.
    46a. *Xenopus laevis laevis* (Daudin). African clawed frog*.....N

Family BUFONIDAE—True Toads.

47. *Bufo alvarius* Girard, *in* Baird. Colorado River toad.....SC,SP,r[36]
48. *Bufo boreas* Baird and Girard. western toad.
    48a. *Bufo boreas boreas* Baird and Girard. boreal toad.....N
    48b. *Bufo boreas halophilus* Baird and Girard. California toad.....N

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[31] Known in California only from a few localities in Del Norte County (Bury et al. 1969, Storm and Brodie 1970, Stebbins 1972). Common in Oregon and Washington.

[32] Taxonomy after Brodie (1971) and Nussbaum et al. (1983).

[33] Taxonomy after Nielson et al. (2001). Stebbins (2003) treats this frog as a single species.

[34] Taxonomy after Tanner (1989a, 1989b) and Wiens and Titus (1991) who removed *Spea* from the synonymy of *Scaphiopus*. For a dissenting view, see Hall (1998).

[35] Known from extreme southeastern California in the region drained by the Colorado River (Jennings and Hayes 1994a). Common in Arizona, New Mexico, Texas, and northern Mexico.

[36] Once fairly common in the lowlands and fields bordering the Colorado River in Imperial County. Foquette (1970) cites Grinnell and Camp (1917), Storer (1925), and Slevin (1928) for original records. Jennings and Hayes (1994a) plotted all known historic records. Probably extirpated over most of its native range in California due to habitat destruction and the heavy use of pesticides. Last known specimens were taken 7 km north of Winterhaven, Imperial County, on July 31, 1955 (LACM 87044). *Bufo alvarius* has only been recorded from the Arizona side of the Colorado River in recent years (Jennings and Hayes 1994a).

49. *Bufo californicus* (Camp). arroyo toad[37].....SC,SP,FE
50. *Bufo canorus* Camp. Yosemite toad.....SC,SP[38]
51. *Bufo cognatus* Say. Great Plains toad.....r
52. *Bufo exsul* Myers. black toad.....ST,SP
53. *Bufo microscaphus* Cope. Arizona toad†.....SC,SP,r[39]
54. *Bufo punctatus* Baird and Girard. red-spotted toad.....N
55. *Bufo woodhousii* Girard. Woodhouse's toad.
    55a. *Bufo woodhousii woodhousii* Girard. Rocky Mountain toad.....N

Family HYLIDAE—Treefrogs and Their Allies.

56. *Hyla cadaverina* Cope. California treefrog[40].....N
57. *Hyla regilla* Baird and Girard. Pacific treefrog[41].
    57a. *Hyla regilla regilla* Baird and Girard. Pacific treefrog.....r
    57b. *Hyla regilla cascadae* Jameson, Mackey, and Richmond. Cascades treefrog.....r
    57c. *Hyla regilla hypochondriaca* Hallowell. southwestern treefrog.....N
    57d. *Hyla regilla pacifica* Jameson, Mackey, and Richmond. coast treefrog....N
    57e. *Hyla regilla sierrae* Jameson, Mackey, and Richmond. Sierra treefrog.....N

Family RANIDAE—True Frogs.

58. *Rana aurora* Baird and Girard. northern red-legged frog[42].....SC,SP
59. *Rana berlandieri* Baird. Rio Grande leopard frog*.....N
60. *Rana boylii* Baird. foothill yellow-legged frog.....SC,SP

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[37] Taxonomy after Gergus (1998). Often referred to in documents as "arroyo southwestern toad" (e.g., see Brown 1994, U.S. Fish and Wildlife Service 1999, California Department of Fish and Game 2004).

[38] This species was recently found to be "warranted, but precluded by higher priority actions" for listing under the Federal Endangered Species Act (U.S. Fish and Wildlife Service 2002a).

[39] Only known from old records near Fort Mohave along the Colorado River near the junction of the California, Nevada, and Arizona state boundaries (Cooper 1870, Slevin 1928). Considered to be present in California by Stebbins (1966, 1972, 1985, 2003).

[40] Hedges (1986) placed this species in the genus *Pseudacris* based on relatively few morphological characters. Cocroft (1994) provided a thorough phylogenetic re-analysis of *Pseudacris* and placed this species back in the genus *Hyla*. Since then, da Silva (1997), as well as Moriarty and Cannatella (2004), have provided additional phylogenetic evidence for once again placing this species back within the genus *Pseudacris*. Based on morphological and behavioral grounds, I remain unconvinced by their arguments and retain this species in the genus *Hyla* (e.g., see Jennings 2000), as does Stebbins (2003).

[41] Ibid.

[42] Taxonomy after Hayes and Miyamoto (1984) who suggested that *Rana aurora aurora* and *R. a. draytonii* might be distinct species. Current biochemical studies support this arrangement (H. B. Shaffer, personal communication).

61. *Rana cascadae* Slater. Cascades frog.....SC,SP,r
62. *Rana catesbeiana* Shaw. bullfrog*.....N
63. *Rana draytonii* Baird and Girard. California red-legged frog[43].....SC,SP,FT
64. *Rana muscosa* Camp. Transverse Range yellow-legged frog[44].....SC,SP,FE[45]
65. *Rana pipiens* Schreber. northern leopard frog*[46].....SC
66. *Rana pretiosa* Baird and Girard. Oregon spotted frog[47].....SC,SP,r[48]
67. *Rana sierrae* Camp. Sierra yellow-legged frog[49].....SC,SP[50]
68. *Rana sphenocephala* Cope. southern leopard frog*[51].
    68a. *Rana sphenocephala utricularia* Harlan. southern leopard frog*.....N
69. *Rana yavapaiensis* Platz and Frost. lowland leopard frog†.....SC,SP,r

Order Testudines—Turtles.
Family CHELONIDAE—Seaturtles.

70. *Caretta caretta* (Linnaeus). loggerhead seaturtle O[52].....FT,r[53]
71. *Chelonia mydas* (Linnaeus). green seaturtle O[54].....FT,r[55]
72. *Lepidochelys olivacea* (Eschscholtz). olive ridley seaturtle O.....FT,r[56]

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[43] Ibid.

[44] These yellow-legged frogs from the mountains of southern California are now considered to be distinct from yellow-legged frog populations in the Sierra Nevada (Macey et al. 2001).

[45] The federal classification is based on the published final rule for this species (see U.S. Fish and Wildlife Service 2002b).

[46] Reportedly native east of the Sierra Nevada (Bury and Luckenbach 1976). Introduced elsewhere in California (see list of Established Introduced Species).

[47] Taxonomy after Green et al. (1997).

[48] Known only from a few locations in Modoc, Siskiyou, and Shasta counties (Jennings and Hayes 1994a). Historically common in Oregon and Washington.

[49] There are probably three different taxa of this frog in the Sierra Nevada (Macey et al. 2001).

[50] This species was recently found to be "warranted, but precluded by higher priority actions" for listing under the Federal Endangered Species Act (Epanchin 2003).

[51] The species name is *spenocephala* based on Opinion 1685 of the ICZN (International Commission on Zoological Nomenclature 1992).

[52] Taxonomy after Dodd (1990) who did not recognize subspecies.

[53] Occasional along the California coast (Stebbins 1972, 1985). More abundant in tropical marine waters further south (Ernst et al. 1994).

[54] Considerable controversy exists regarding the taxonomy of green seaturtles of the Pacific Ocean. Following Crother et al. (2000), I have not included any subspecies pending more definitive taxonomic work for the group.

[55] Occasional along the California coast (Stebbins 1972, 1985). More abundant in tropical marine waters further south (Ernst et al. 1994). Known to breed off the coast of California (e.g., see Smith and Houck 1984).

[56] Ibid.

Family DERMOCHELYIDAE—Leatherback Seaturtles.

73. *Dermochelys coriacea* (Vandelli). leatherback seaturtle O[57].....FE,r[58]

Family CHELYDRIDAE—Snapping Turtles.

74. *Chelydra serpentina* (Linnaeus). snapping turtle*.
74a. *Chelydra serpentina serpentina* (Linnaeus). eastern snapping turtle*.....N

Family KINOSTERNIDAE—Musk and Mud Turtles.

75. *Kinosternon sonoriense* Le Conte. Sonoran mud turtle†.
75a. *Kinosternon sonoriense sonoriense* Le Conte. Sonoran mud turtle†....SC,SP

Family TRIONYCHIDAE—Softshell Turtles[59].

76. *Apalone spinifera* (Lesuer). spiny softshell*.
76a. *Apalone spinifera emoryi* (Agassiz). Texas spiny softshell*.....N

Family EMYDIDAE—Box and Water Turtles.

77. *Actinemys marmorata* (Baird and Girard)[60]. western pond turtle[61].
77a. *Actinemys marmorata marmorata* (Baird and Girard). northwestern pond turtle.....SC,SP
77b. *Actinemys marmorata pallida* (Seeliger). southwestern pond turtle.....SC,SP
78. *Trachemys scripta* (Schoepff). pond slider*[62].
78a. *Trachemys scripta elegans* (Wied-Neuwied). red-eared slider*.....N

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[57] Taxonomy after Pritchard (1980) who did not recognize any subspecies.

[58] Occasional along the California coast (Stebbins 1972, 1985; Starbird et al. 1993). More abundant in tropical marine waters further south (Ernst et al. 1994).

[59] Taxonomy after Meylan (1987).

[60] I follow Crother et al. (2003) and use the generic name of *Actinemys*. Stebbins (2003) continued to use the generic name *Clemmys*, although there is evidence to also include this turtle under the genus *Emys* (Ernst 2001, Fieldman and Parham 2002).

[61] I use the name "western pond turtle" as it is well established in the published literature and California Department of Fish and Game documents (e.g., see Stebbins 1972, 1985, 2003; Jennings and Hayes 1994a; and Ernst et al. 1994). Crother et al. (2000, 2003) use "Pacific pond turtle" after Carr (1952) and Iverson (1992).

[62] Taxonomy after Seidel and Smith (1986).

Family TESTUDINIDAE—True Land Tortoises.

79. *Gopherus agassizii* (Cooper). desert tortoise[63].....ST,FT

Order Squamata—Lizards and Snakes.
Family IGUANIDAE—Iguanas and Chuckwallas.

80. *Dipsosaurus dorsalis* (Baird and Girard). desert iguana.
80a. *Dipsosaurus dorsalis dorsalis* (Baird and Girard). northern desert iguana.....N
81. *Sauromalus ater* Duméril. common chuckwalla[64].....N

Family CROTAPHYTIDAE—Collard and Leopard Lizards.

82. *Crotaphytus bicinctores* Smith and Tanner. Great Basin collared lizard[65].....N
83. *Crotaphytus vestigium* Smith and Tanner. Baja California collared lizard[66].....r
84. *Gambelia copeii* (Yarrow). Cope's leopard lizard[67].....r[68]
85. *Gambelia sila* (Stejneger). blunt-nosed leopard lizard[69].....SE,SP,FE
86. *Gambelia wislizenii* (Baird and Girard). long-nosed leopard lizard[70].....N

Family PHRYNOSOMATIDAE—Zebra-Tailed, Rock, Horned, Spiny, Fringe-toed, Tree, and Side-Blotched Lizards.

87. *Callisaurus dranconoides* Blainville. zebra-tailed lizard[71].
87a. *Callisaurus draconoides myurus* Richardson. northern zebra-tailed lizard.....r

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[63] Bramble (1982) places *Gopherus agassizii* and *G. berlandieri* in the genus *Scaptochelys*. Although the generic name *Xerobates* supersedes *Scaptochelys* (Bour and Dubois 1984, Smith 1985), I follow Stebbins (1985), Turner (1986), Banks et al. (1987), Crumly (1994), and Ernst et al. (1994) and continue to use *Gopherus*. Escaped or released pets of this species are commonly encountered near residential areas (Bury and Luckenbach 1976; Storer, unpublished field notes; S. J. Barry, personal communication; G. R. Stewart, personal communication; Jennings, unpublished data). There are over 10,000 desert tortoises now kept as pets in California (St. Amant and Hoover 1978).

[64] Taxonomy after Hollingsworth (1998).

[65] Taxonomy after McGuire (1996).

[66] Ibid. A proposal to utilize this name, instead of an older available name, has been submitted to the ICZN as Case 3136 (McGuire 2000).

[67] Ibid.

[68] Known only from a relatively small area in extreme southeastern San Diego County (McGuire 1996). Common in Baja California, México.

[69] Taxonomy and spelling after Jennings (1995).

[70] Taxonomy after McGuire (1996).

[71] Taxonomy after de Queiroz (1989).

87b. *Callisaurus draconoides rhodostictus* Cope. western zebra-tailed lizard.....N
87c. *Callisaurus draconoides ventralis* (Hallowell). eastern zebra-tailed lizard.....N
88. *Petrosaurus mearnsi* (Stejenger). banded rock lizard.
88a. *Petrosaurus mearnsi mearnsi* (Stejneger). Mearns' rock lizard.....N
89. *Phrynosoma coronatum* (Blainville). coast horned lizard[72].
89a. *Phrynosoma coronatum blainvillii* Gray. San Diego horned lizard.....SC,SP
89b. *Phrynosoma coronatum frontale* Van Denburgh. California horned lizard.....SC,SP
90. *Phrynosoma douglasii* (Bell). pigmy short-horned lizard[73].....r
91. *Phrynosoma mcallii* (Hallowell). flat-tailed horned lizard.....SC,SP
92. *Phrynosoma platyrhinos* Girard. desert horned lizard.
92a. *Phrynosoma platyrhinos platyrhinos* Girard. northern desert horned lizard.....N
92b. *Phrynosoma platyrhinos calidiarum* (Cope). southern desert horned lizard.....N
93. *Sceloporus graciosus* Baird and Girard. sagebrush lizard.
93a. *Sceloporus graciosus graciosus* Baird and Girard. northern sagebrush lizard.....N
93b. *Sceloporus graciosus gracilis* Baird and Girard. western sagebrush lizard.....N
93c. *Sceloporus graciosus vandenburgianus* Cope. southern sagebrush lizard[74].....N
94. *Sceloporus magister* Hallowell. desert spiny lizard.
94a. *Sceloporus magister transversus* Phelan and Brattstrom. barred spiny lizard.....N
94b. *Sceloporus magister uniformis* Phelan and Brattstrom. yellow-backed spiny lizard.....N
95. *Sceloporus occidentalis* Baird and Girard. western fence lizard.
95a. *Sceloporus occidentalis occidentalis* Baird and Girard. northwestern fence lizard.....N
95b. *Sceloporus occidentalis becki* Van Denburgh. island fence lizard[75].....FP
95c. *Sceloporus occidentalis biseriatus* Hallowell. San Joaquin fence lizard.....N
95d. *Sceloporus occidentalis bocourtii* Boulenger. Coast Range fence lizard.....N

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[72] Taxonomy after Jennings (1988b) and Jennings and Hayes (1994a). See Brattstrom (1997) for a dissenting opinion.

[73] Taxonomy after Zamudio et al. (1997). The spelling of the species name follows Hammerson and Smith (1991).

[74] Sometimes considered as a full species (e.g., see Wiens and Reeder 1997).

[75] Ibid.

95e. *Sceloporus occidentalis longipes* Baird. Great Basin fence lizard.....N
95f. *Sceloporus occidentalis taylori* Camp. Sierra fence lizard.....N
96. *Sceloporus orcutti* Stejneger. granite spiny lizard.....N
97. *Uma inornata* Cope. Coachella Valley fringe-toed lizard.....SE,FT
98. *Uma notata* Baird. Colorado Desert fringe-toed lizard[76].....SC
99. *Uma scoparia* Cope. Mojave fringe-toed lizard.....SC
100. *Urosaurus graciosus* Hallowell. long-tailed brush lizard.
100a. *Urosaurus graciosus graciosus* Hallowell. western brush lizard..... N
101. *Urosaurus nigricaudus* (Cope). Baja California brush lizard[77].....r
102. *Urosaurus ornatus* (Baird and Girard). tree lizard.
102a. *Urosaurus ornatus symmetricus* (Baird). Colorado River tree lizard.....r
103. *Uta stansburiana* Baird and Girard. common side-blotched lizard.
103a. *Uta stansburiana stansburiana* Baird and Girard. northern side-blotched lizard.....N
103b. *Uta stansburiana elegans* Yarrow. California side-blotched lizard.....N

Family EUBLEPHARIDAE—Eyelidded Geckos[78].

104. *Coleonyx switaki* (Murphy). Switak's banded gecko[79].
104a. *Coleonyx switaki switaki* (Murphy). peninsular banded gecko[80].....ST
105. *Coleonyx variegatus* (Baird). western banded gecko.
105a. *Coleonyx variegatus variegatus* (Baird). desert banded gecko.....N
105b. *Coleonyx variegatus abbotti* Klauber. San Diego banded gecko.....N

Family GEKKONIDAE—Geckos.

106. *Phyllodactylus nocticolus* Dixon. peninsular leaf-toed gecko[81].....SP
107. *Hemidactylus turcicus* (Linnaeus). Mediterranean house gecko*.
107a. *Hemidactylus turcicus turcicus* (Linnaeus). Turkish house gecko*.....N
108. *Tarentola mauritanica* (Linnaeus). Moorish wall gecko*.....N

Family ANGUIDAE—Alligator and Legless Lizards[82].

109. *Anniella pulchra* Gray. California legless lizard[83].

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[76] Taxonomy after Trépanier and Murphy (2001).
[77] Taxonomy after Aguirre et al. (1999) and Grismer (1999a).
[78] Taxonomy after Kluge (1987).
[79] Taxonomy after Grismer (1983).
[80] Taxonomy after Grismer and Ottley (1988).
[81] Taxonomy after Murphy (1983).
[82] Stebbins (2003) has legless lizards as a family separate from Anguidae.
[83] Nomenclature follows Opinion 1735 of the ICZN (International Commission on Zoological Nomenclature 1993). Pearse and Pogson (2000), provided evidence that the subspecies of *Anniella pulchra*, as currently defined, are not supported by molecular evidence.

109a. *Anniella pulchra pulchra* Gray. silvery legless lizard.....SP
109b. *Anniella pulchra nigra* Fischer. black legless lizard.....SC,SP
110. *Elgaria coerulea* (Wiegmann). northern alligator lizard[84].
110a. *Elgaria coerulea coerulea* (Wiegmann). San Francisco alligator lizard.....N
110b. *Elgaria coerulea palmeri* (Stejneger). Sierra alligator lizard.....N
110c. *Elgaria coerulea principis* Baird and Girard. northwestern alligator lizard.....r
110d. *Elgaria coerulea shastensis* (Fitch). Shasta alligator lizard.....N
111. *Elgaria multicarinata* (Blainville). southern alligator lizard[85].
111a. *Elgaria multicarinata multicarinata* (Blainville). California alligator lizard.....N
111b. *Elgaria multicarinata scincicauda* (Skilton). Oregon alligator lizard.....N
111c. *Elgaria multicarinata webbii* (Baird). San Diego alligator lizard.....N
112. *Elgaria panamintina* (Stebbins). Panamint alligator lizard[86].....SC,SP

Family HELODERMATIDAE—Venomous Lizards.

113. *Heloderma suspectum* Cope. Gila monster.
113a. *Heloderma suspectum cinctum* Bogert and Martín del Campo. banded Gila monster.....SC,SP,r[87]

Family SCINCIDAE—Skinks.

114. *Eumeces gilberti* Van Denburgh. Gilbert's skink[88].
114a. *Eumeces gilberti gilberti* Van Denburgh. greater brown skink.....N
114b. *Eumeces gilberti cancellosus* Rodgers and Fitch. variegated skink.....N
114c. *Eumeces gilberti placerensis* Rodgers. northern brown skink.....N
114d. *Eumeces gilberti rubricaudatus* Taylor. western red-tailed skink.....N
115. *Eumeces skiltonianus* (Baird and Girard). western skink[89].
115a. *Eumeces skiltonianus skiltonianus* (Baird and Girard). Skilton's skink.....N

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[84] Taxonomy after Good (1988).
[85] Ibid.
[86] Ibid.
[87] Recorded in California from only a few locations in Imperial, Inyo, and San Bernardino counties (Bradley and Deacon 1966, Funk 1966, Ford 1981, DeLisle 1985, Jennings and Hayes 1994a). The following reports are all escaped pets: Klauber (1931) from Jacumba Mountain, San Diego County; Bury and Luckenbach (1976) from residential areas of Walnut Creek, Contra Costa County; and Storer (unpublished field notes) from Peachy Canyon near Paso Robles, San Luis Obispo County; the Santa Clara River near Ventura, Ventura County; and Beverly Hills, Los Angeles County.
[88] According to evidence presented by Richmond and Reeder (2002), this taxon is probably composed of several species.
[89] Ibid.

115b. *Eumeces skiltonianus interparietalis* Tanner. Coronado skink.....SC,r

Family TEIIDAE—Whiptail Lizards[90].

116. *Aspidoscelis hyperythra* (Cope). orange-throated whiptail[91].
116a. *Aspidoscelis hyperythra beldingi* (Stejneger). Belding's orange-throated whiptail.....SC,SP,r
117. *Aspidoscelis tigris* (Baird and Girard). tiger whiptail[92].
117a. *Aspidoscelis tigris tigris* (Baird and Girard). Great Basin whiptail.....N
117b. *Aspidoscelis tigris munda* (Camp). California whiptail.....N
117c. *Aspidoscelis tigris stejnegeri* (Van Denburgh). coastal whiptail.....N

Family XANTUSIIDAE—Night Lizards.

118. *Xantusia henshawi* Stejneger. Henshaw's night lizard.
118a. *Xantusia henshawi henshawi* Stejneger. granite night lizard.....N
118b. *Xantusia henshawi gracilis* Grismer and Galvan. sandstone night lizard[93].....SC,SP
119. *Xantusia riversiana* Cope. island night lizard.....SP,FT
119a. *Xantusia riversiana riversiana* Cope. San Nicolas night lizard.....SP,FT
119b. *Xantusia riversiana reticulata* Smith. San Clemente night lizard.....SP,FT
120. *Xantusia vigilis* Baird. desert night lizard.
120a. *Xantusia vigilis vigilis* Baird. yucca night lizard.....N
120b. *Xantusia vigilis sierrae* Bezy. Sierra night lizard.....SC

Family LEPTOTYPHLOPIDAE—Threadsnakes[94].

121. *Leptotyphlops humilis* (Baird and Girard). western threadsnake.
121a. *Leptotyphlops humilis humilis* (Baird and Girard). southwestern threadsnake.....N
121b. *Leptotyphlops humilis cahuilae* Klauber. desert threadsnake.....N

Family BOIDAE—Boas[95].

122. *Charina bottae* (Blainville). rubber boa.
122a. *Charina bottae bottae* (Blainville). northern rubber boa.....N

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[90] Taxonomy after Reeder et al. (2002).

[91] Taxonomy after Thompson et al. (1998). See Grismer (1999b) for a dissenting opinion.

[92] Taxonomy and nomenclature follow the suggestions of Crother et al. (2000).

[93] Lovich (2001) proposed this taxon to be a full species.

[94] Vernacular name after Crother et al. (2000). Stebbins (2003) uses the vernacular name "blind snake".

[95] Taxonomy as listed by Crother et al. (2000). Kluge (1993) placed *Lichanura* in synonymy with *Charina*.

122b. *Charina bottae umbratica* Klauber. southern rubber boa[96].....ST
123. *Lichanura trivirgata* Cope. rosy boa[97].
123a. *Lichanura trivirgata gracia* Klauber. desert rosy boa.....N
123b. *Lichanura trivirgata roseofusca* Cope. coastal rosy boa.....N

Family COLUBRIDAE—Colubrids.

124. *Arizona elegans* Kennicott, *in* Baird. glossy snake.
124a. *Arizona elegans candida* Klauber. Mojave glossy snake.....N
124b. *Arizona elegans eburnata* Klauber. desert glossy snake.....N
124c. *Arizona elegans occidentalis* Blanchard. California glossy snake.....N
125. *Bogertophis rosaliae* (Mocquard). Baja California rat snake[98].....SC,r[99]
126. *Chionactis occipitalis* (Hallowell). western shovel-nosed snake.
126a. *Chionactis occipitalis occipitalis* (Hallowell). Mojave shovel-nosed snake.....N
126b. *Chionactis occipitalis annulata* (Baird). Colorado Desert shovel-nosed snake.....N
126c. *Chionactis occipitalis talpina* Klauber. Nevada shovel-nosed snake.....r
127. *Coluber constrictor* Linnaeus. racer.
127a. *Coluber constrictor mormon* Baird and Girard. western yellow-bellied racer[100].....N
128. *Conta tenuis* (Baird and Girard). sharp-tailed snake[101].....N
129. *Diadophis punctatus* (Linnaeus). ring-necked snake.
129a. *Diadophis punctatus amabilis* Baird and Girard. Pacific ring-necked snake.....N
129b. *Diadophis punctatus modestus* Bocourt. San Bernardino ring-necked snake.....N
129c. *Diadophis punctatus occidentalis* Blanchard. northwestern ring-necked snake.....N
129d. *Diadophis punctatus pulchellus* Baird and Girard. coral-bellied ring-necked snake.....N
129e. *Diadophis punctatus regalis* Baird and Girard. regal ring-necked snake.....r

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[96] Rodríguez-Robles et al. (2001) consider this taxon to be a full species. Crother et al. (2000) and Stebbins (2003) list this snake as a subspecies of *Charina bottae*.

[97] Taxonomy after Yingling (1982). See Spiteri (1988) for a dissenting opinion on the arrangement of the subspecies of this snake.

[98] Taxonomy after Price (1990).

[99] Known only from a single road-killed specimen (SDSNH 64416) taken on May 26, 1984 on Interstate 8, about 3.84 km east of Mountain Spring, Imperial County (Jennings and Hayes 1994a).

[100] Fitch et al. (1981) consider this snake to be a full species. See Greene (1984) and Corn and Bury (1986) for evidence supporting *C. c. mormon* as a valid subspecies of *C. constrictor*.

[101] This taxon is probably comprised of two species (Hoyer 2001, Feldman and Spicer 2002).

129f. *Diadophis punctatus similis* Blanchard. San Diego ring-necked snake.....N
129g. *Diadophis punctatus vandenburghii* Blanchard. Monterey ring-necked snake.....N
130. *Hypsiglena torquata* (Günther). nightsnake.
130a. *Hypsiglena torquata deserticola* Tanner. desert nightsnake.....N
130b. *Hypsiglena torquata klauberi* Tanner. San Diego nightsnake[102].....N
130c. *Hypsiglena torquata nuchalata* Tanner. California nightsnake.....N
131. *Lampropeltis getula* (Linnaeus). common kingsnake[103].
131a. *Lampropeltis getula californiae* (Blainville). California kingsnake.....N
132. *Lampropeltis zonata* (Lockington *ex.* Blainville). California mountain kingsnake[104].....N
132a. *Lampropeltis zonata zonata* (Lockington *ex.* Blainville). St. Helena mountain kingsnake.....N
132b. *Lampropeltis zonata multicincta* (Yarrow). Sierra mountain kingsnake.....N
132c. *Lampropeltis zonata multifasciata* (Bocourt). coast mountain kingsnake.....N
132d. *Lampropeltis zonata parvirubra* Zweifel. San Bernardino mountain kingsnake.....SC
132e. *Lampropeltis zonata pulchra* Zweifel. San Diego mountain kingsnake.....SC,SP
133. *Masticophis flagellum* (Shaw). coachwhip.
133a. *Masticophis flagellum fulginosus* (Cope). Baja California coachwhip[105].....r
133b. *Masticophis flagellum piceus* (Cope). red coachwhip.....N
133c. *Masticophis flagellum ruddocki* Brattstrom and Warren. San Joaquin coachwhip.....SC,SP
134. *Masticophis lateralis* (Hallowell). striped racer[106].
134a. *Masticophis lateralis* (Hallowell). California striped racer.....N
134b. *Masticophis lateralis euryxanthus* Riemer. Alameda striped racer[107].....ST,FT

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[102] Not listed in Crother et al. (2000), but considered valid by Tanner (1985).

[103] Blaney (1977) reports intergrades between *L. g. californiae* and *L. g. nigrita* in the lower Colorado River Valley.

[104] Rodríguez-Robles et al. (1999) found only three distinct groupings for this snake which calls into question the present taxonomic arrangement for the subspecies of *Lampropeltis zonata*. However, they suggest retaining the subspecies I have listed until further studies are conducted on the genetics of *L. zonata*.

[105] Grismer (1994) pointed out evidence that strongly recommends that this snake be considered a full species.

[106] In some publications and documents, this snake is referred to as a "California whipsnake" (e.g., see Stebbins 1985).

[107] Also known as the "Alameda whipsnake" (e.g., see Stebbins 1985, Nagano 1994, Hansen 1994, Westphal et al. 1997).

135. *Masticophis taeniatus* (Hallowell). striped whipsnake.
135a. *Masticophis taeniatus taeniatus* (Hallowell). desert striped whipsnake.....N
136. *Nerodia fasciata* (Linnaeus). southern watersnake*.
136a. *Nerodia fasciata fasciata* (Linnaeus). banded watersnake*.....N
137. *Phyllorhynchus decurtatus* (Cope). spotted leaf-nosed snake[108].....N
137a. *Phyllorhynchus decurtatus perkinsi* Klauber. desert leaf-nosed snake...N
138. *Pituophis catenifer* (Blainville). gophersnake[109].
138a. *Pituophis catenifer catenifer* (Blainville). Pacific gophersnake.....N
138b. *Pituophis catenifer affinis* (Hallowell). Sonoran gophersnake.....N
138c. *Pituophis catenifer annectens* Baird and Girard. San Diego gophersnake.....N
138d. *Pituophis catenifer deserticola* Stejneger. Great Basin gophersnake.....N
138e. *Pituophis catenifer pumilus* Klauber. Santa Cruz gophersnake.....SC,FP
139. *Rhinocheilus lecontei* Baird and Girard. long-nosed snake.
139a. *Rhinocheilus lecontei lecontei* Baird and Girard. western long-nosed snake.....N
140. *Salvadora hexalepis* (Cope). western patch-nosed snake.
140a. *Salvadora hexalepis hexalepis* (Cope). desert patch-nosed snake.....r
140b. *Salvadora hexalepis mojavensis* Bogert. Mojave patch-nosed snake.....N
140c. *Salvadora hexalepis virgultea* Bogert. coast patch-nosed snake.....SC
141. *Sonora semiannulata* Baird and Girard. groundsnake.....N
142. *Tantilla hobartsmithi* Taylor. Smith's black-headed snake.....N
143. *Tantilla planiceps* (Blainville). western black-headed snake.....N
144. *Thamnophis atratus* (Kennicott, *in* Cooper). aquatic gartersnake[110].
144a. *Thamnophis atratus atratus* (Kennicott, *in* Cooper). Santa Cruz gartersnake.....N
144b. *Thamnophis atratus hydrophilus* Fitch. Oregon gartersnake.....N
144c. *Thamnophis atratus zaxanthus* Boundy. Diablo Range gartersnake[111].....N
145. *Thamnophis couchii* (Kennicott, *in* Baird). Sierra gartersnake[112].....N
146. *Thamnophis elegans* (Baird and Girard). terrestrial gartersnake[113].
146a. *Thamnophis elegans elegans* (Baird and Girard). mountain gartersnake.....N
146b. *Thamnophis elegans terrestris* Fox. coast gartersnake.....N

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[108] Taxonomy after McCleary and McDiarmid (1993) who called into question several subspecies of this snake.

[109] Taxonomy after Reichling (1995) and Rodríguez-Robles and De Jesús-Escobar (2000).

[110] Taxonomy after Rossman and Stewart (1987) and Boundy (1999) who recommended against recognizing *T. a. aquaticus*.

[111] Taxonomy after Boundy (1999). Not listed in Stebbins (2003).

[112] Taxonomy after Rossman and Stewart (1987).

[113] Taxonomy after Rossman et al. (1996).

146c. *Thamnophis elegans vagrans* (Baird and Girard). wandering gartersnake.....r
147. *Thamnophis gigas* Fitch. giant gartersnake[114].....ST,FT
148. *Thamnophis hammondii* (Kennicott). two-striped gartersnake[115].....SC,SP
149. *Thamnophis marcianus* (Baird and Girard). checkered gartersnake.
149a. *Thamnophis marcianus marcianus* (Baird and Girard). Marcy's checkered gartersnake.....r
150. *Thamnophis ordinoides* (Baird and Girard). northwestern gartersnake.....r
151. *Thamnophis sirtalis* (Linnaeus). common gartersnake.
151a. *Thamnophis sirtalis fitchi* Fox. valley gartersnake.....N
151b. *Thamnophis sirtalis infernalis* (Blainville). California red-sided gartersnake[116].....N
151c. *Thamnophis sirtalis* ssp. South Coast garter snake.....SC
151d. *Thamnophis sirtalis tetrataenia* (Cope, *in* Yarrow). San Francisco gartersnake[117].....SE,SP,FE
152. *Trimorphodon biscutatus* (Duméril, Bibron, and Duméril). western lyresnake.
152a. *Trimorphodon biscutatus lambda* Cope. Sonoran lyresnake.....N
152b. *Trimorphodon biscutatus lyrophanes* (Cope). California lyresnake[118].....N

Family ELAPIDAE—Coral Snakes and Seasnakes[119].

153. *Pelamis platurus* (Linnaeus). yellow-bellied seasnake O.....r[120]

Family VIPERIDAE—Vipers.

154. *Crotalus atrox* Baird and Girard. western diamond-backed rattlesnake.....N
155. *Crotalus cerastes* Hallowell. sidewinder.
155a. *Crotalus cerastes cerastes* Hallowell. Mojave Desert sidewinder.....N
155b. *Crotalus cerastes laterorepens* Klauber. Colorado Desert sidewinder.....N
156. *Crotalus mitchellii* (Cope). speckled rattlesnake.
156a. *Crotalus mitchellii pyrrhus* (Cope). southwestern speckled rattlesnake.....N

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[114] Taxonomy after Rossman and Stewart (1987).

[115] Taxonomy after Rossman and Stewart (1987). No subspecies are currently recognized (see McGuire and Grismer 1993).

[116] The subspecies name is *infernalis* based on Opinion 1961 of the ICZN (International Commission on Zoological Nomenclature 2000a).

[117] The subspecies name is *tetrataenia* based on Opinion 1961 of the ICZN (International Commission on Zoological Nomenclature 2000a).

[118] Taxonomy after Grismer et al. (1994).

[119] Stebbins (2003) lists seasnakes as a family separate from Elaphidae.

[120] Strays are occasionally found in California waters (Kropach 1975, Pickwell and Culotta 1980, Pickwell et al. 1983). Such occurrences are probably due to storm enhanced currents which sweep the snakes north of their breeding range off the southern Baja California coast.

156b. *Crotalus mitchellii stephensi* Klauber. Panamint rattlesnake.....N
157. *Crotalus ruber* Cope. red diamond rattlesnake[121].
157a. *Crotalus ruber ruber* Cope. red diamond rattlesnake.....SC
158. *Crotalus scutulatus* (Kennicott). Mohave rattlesnake.
158a. *Crotalus scutulatus scutulatus* (Kennicott). Mohave green rattlesnake.....N
159. *Crotalus oreganus* Holbrook. western rattlesnake[122].
159a. *Crotalus oreganus oreganus* Holbrook. northern Pacific rattlesnake.....N
159b. *Crotalus oreganus helleri* Meek. southern Pacific rattlesnake.....N
159c. *Crotalus oreganus lutosus* Klauber. Great Basin rattlesnake.....N

SUPPLEMENTARY LISTS:
Native Species Extinct in California.

Order Caudata—Salamanders.
Family PLETHODONTIDAE—Lungless Salamanders.

1. *Batrachoseps* sp. Breckenridge Mountain slender salamander†.

This undescribed species of slender salamander is currently known from a single location on Breckenridge Mountain, Kern County (R. W. Hansen, personal communication). The salamander apparently became extinct after a U.S. Forest Service road was rerouted above the seep that was its only known habitat (Jennings 1996). Repeated surveys over the past 15 years have located no other populations of this taxon to date (R. W. Hansen, personal communication), although recent collections of slender salamanders taken in the general vicinity are currently under study (J. V. Vindum, personal communication).

Order Anura—Toads and Frogs.
Family BUFONIDAE—True Toads.

2. *Bufo microscaphus* Cope. Arizona toad†.

This toad was historically found in the vicinity of Fort Mohave along the Colorado River (near the Nevada border) [Cooper 1870, Storer 1925, Slevin 1928). All known records are well over 100 years old and no specimens have been seen or collected along the Colorado River in California during the past century. The species has apparently disappeared in California due to extensive habitat modifications along the Colorado River.

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[121]The species name is *ruber* based on Opinion 1960 of the ICZN (International Commission on Zoological Nomenclature 2000b).

[122] Taxonomy follows the suggestion of Crother et al. (2003).

Family RANIDAE—True Frogs.

3. *Rana yavapaiensis* Platz and Frost. lowland leopard frog†.

Historically known from the lower Colorado River, San Felipe Creek drainage, and Imperial Valley prior to conversion of the desert habitats to irrigated agriculture (Storer 1925, Stebbins 1951, Ruibal 1959, Platz 1988). This frog apparently inhabited slackwater aquatic habitats and colonized canals, roadside ditches, and ponds in the Imperial Valley as surrounding desert lands were converted to agriculture (Storer 1925, Klauber 1934). The reason for their decline and extinction is apparently due, in part, to habitat loss, the introduction of exotic predatory sport fishes, the use of a wide variety of pesticides, and changes in agricultural practices (Jennings and Hayes 1994b; Jennings and Fuller 2004). The species began to disappear in the 1950s and was apparently extirpated from most of California by the early 1960s. The last known specimens (an adult female and egg mass) were collected by Robert L. Livezey and John M. Brode in an irrigation ditch east of Calexico, Imperial County, on April 12-13, 1965 (SSU 519-520) [Jennings and Hayes 1994b]. Recent surveys by Vitt and Ohmart (1978), and Clarkson and Rorabaugh (1989), and Jennings and Hayes (1994a, 1994b) failed to locate any extant populations along the lower Colorado River and Imperial Valley. Today, most suitable aquatic habitats in this area are occupied by introduced bullfrogs and Rio Grande leopard frogs (Jennings and Fuller 2004).

Order Testudines—Turtles.
Family KINOSTERNIDAE—Musk and Mud Turtles.

4. *Kinosternon sonoriense* Le Conte. Sonoran mud turtle†.
   4a. *Kinosternon sonoriense sonoriense* Le Conte. Sonoran mud turtle†.

Populations of the Sonoran mud turtle were never known to be abundant in the state. The earliest records are by Cooper (1870), who reported this turtle from the Colorado River. Positively known only from old records listed by Van Denburgh (1922) at Palo Verde and the Yuma Indian Reservation, Imperial County, along the lower Colorado River (Stebbins 1954, 1966, 1972, 1985, 2003). Dill (1944) reported seeing *K. sonoriense* in the Colorado River in 1942, but did not obtain any specimens. With extensive changes in habitat along the Colorado River over the past 62 years, the species now appears to be extinct in California even though it is protected by State law (California Fish and Game Commission 2004).

Distributionally or Taxonomically Invalid Species.

Order Testudines—Turtles.
Family CHELONIDAE—Seaturtles.

1. *Eretmochelys imbricata* (Linnaeus). hawksbill seaturtle **O.**
   1a. *Eretmochelys imbricata bissa* (Ruppell). Pacific hawksbill seaturtle **O.**

Listed by Stebbins (1972, 1985, 2003) and Ernst et al. (1994) to be present in California waters. However, there is no evidence that hawksbill seaturtles have ever inhabited California waters, even during periods of exceptionally warm ocean water temperatures (Stinson[123] 1984).

Family KINOSTERNIDAE—Musk and Mud Turtles.

2. *Kinosternon flavescens* (Agassiz). yellow mud turtle.
   2a. *Kinosternon flavescens arizonense* Gilmore. Arizona mud turtle.

Thought by Stebbins (1966, 1972) to be expected in California because of its close proximity in Yuma, Arizona. This is no longer considered to be the case (Seidel 1978).

Family TRIONYCHIDAE—Softshell Turtles.

3. *Aspidonectes californiana* Rivers. "Sacramento softshell."

Described by Rivers (1889) from a specimen obtained by three fishermen from the Sacramento River. Van Denburgh (1917) concluded this turtle was an escaped specimen from the San Francisco Fish Markets and originated from China. Pope (1935) concurred with Van Denburgh and declared the specimen to be "*Trionyx* [=*Pelodiscus*] *sinensis* (Weigmann)", a softshell turtle native only to eastern Asia. Webb (1975) has since considered this softshell to be *Palea steindachneri* (Siebenrock), a species also native to Asia. No other specimens have been recorded from the wild in California.

Order Squamata—Lizards and Snakes.
Family POLYCHRIDAE—Anoles.

4. *Anolis cooperi* Baird. "Cooper's anole."

Although described by Baird (1858) as a member of the California herpetofauna, this lizard has long been an enigma to herpetologists. The two syntypes (USNM 4165) were

[123] Stinson, M. L. 1984. Biology of sea turtles in San Diego Bay, California, and in the northeastern Pacific Ocean. Unpublished M.S. Thesis, San Diego State University, San Diego, California. 2 volumes.

found in a bottle also containing a specimen of *Sceloporus occidentalis* (USNM 2871) collected by James Graham Cooper in California in 1852. Subsequently, another specimen (USNM 6002) was reported by Yarrow (1882) from "Cape Punta, Florida" (collector unknown). Unfortunately, the syntypes disappeared soon after Cope (1862) compared them with *Anolis maculata*, *A. cuprens*, and *A. sagrei*, and even though Barbour (1931) stated that the "Cape Punta" specimen was a paratype of *A. stejnegeri* [=*A. sagrei*], a recent search of the USNM collection revealed that USNM 6002 is also missing (R. McDiarmid, personal communication). Therefore, the exact origin and identity of *A. cooperi* remains somewhat of a mystery. It is certainly not a member of the California herpetofauna, but the possibility cannot be ruled out that Dr. Cooper obtained his specimens en route to California, or from someone in port in San Francisco or Sacramento who brought the specimens from the Caribbean region. A more likely scenario is that someone inadvertently placed the specimens in the jar containing Dr. Cooper's California *Sceloporus* specimen.

Introduced Established Species.
Order Caudata—Salamanders.

Family AMBYSTOMATIDAE—Mole Salamanders and Relatives.

1. *Ambystoma tigrinum* (Green). tiger salamander*.
   1a. *Ambystoma tigrinum diaboli* Dunn. gray tiger salamander*.
   1b. *Ambystoma tigrinum mavortium* Baird. barred tiger salamander*.
   1c. *Ambystoma tigrinum melanostictum* (Baird). blotched tiger salamander*.
   1d. *Ambystoma tigrinum nebulosum* Hallowell. Arizona tiger salamander*.

Larvae of these subspecies (excluding the native population of *A. t. melanostictum* at Grass Lake, Siskiyou County) have been widely introduced into ponds and reservoirs in the Central Valley, South Coast Range, and southern California from various sources for use as live fish bait. There apparently was an extensive effort beginning in the 1930s by a couple of individuals to propagate introduced tiger salamander larvae in Monterey and San Benito counties for use as fish bait (H. B. Shaffer, personal communication). Many of these introductions have subsequently resulted in hybrid swarms between native and introduced tiger salamanders (Jennings and Hayes 1994a; H. B. Shaffer, personal communication). Known established populations of various subspecies of introduced tiger salamanders include stock ponds in Santa Clara, Monterey, San Benito, Santa Barbara, and San Diego counties (Jennings, unpublished data). An isolated population of tiger salamanders in the eastern Sierra in Mono County is of uncertain origin (Jennings 1996). A number of these locations in the state have been sampled for future genetic studies (H. B. Shaffer, personal communication). The continued spread of introduced tiger salamander populations in California is to be expected and is a threat to remaining California tiger salamander populations (McLaughlin et al. 2000). Larval tiger salamanders now prohibited for sale as live fish bait (California

Administrative Code 2004), although Mexican axolotls (*A. mexicanum*) are still commonly observed in the pet trade (Jennings, personal observation).

Order Anura—Toads and Frogs.
Family PIPIDAE—Tongueless Frogs.

2. *Xenopus laevis* (Daudin). African clawed frog*.
2a. *Xenopus laevis laevis* (Daudin). African clawed frog*.

Several species of the genus *Xenopus* were once widely imported into the state for use in human pregnancy tests, biological research, and also for the pet trade (McCoid and Fritts 1980a). Escaped or released individuals have developed large breeding populations in Imperial, Los Angeles, Orange, Riverside, and San Diego counties (St. Amant et al. 1973, Mahrdt and Knefler 1973, McCoid 1976, McCoid and Fritts 1980a, Stebbins 1985, 2003; McCoid et al. 1993, Tinsley and McCoid 1996; Jennings, unpublished data). All extant populations seem to be *Xenopus laevis laevis*, the subspecies widely imported for use in biological research and in human pregnancy diagnosis (Tinsley and McCoid 1996). The population of frogs in the Santa Clara River basin at Vasquez Rocks, Los Angeles County, was greatly reduced to prevent the spread of the species into adjacent drainages further north (St. Amant 1975, Bell 1978, Branning 1979). However, since the mid-1980s, this frog has built up large populations in Soledad, Agua Dulce and Placerita Canyons (Tinsley and McCoid 1996) and is now present throughout the mainstem Santa Clara River (including the estuary) in Ventura and Los Angeles counties (Lafferty and Page 1997). To date, there have been no records of any clawed frogs north of Los Angeles County, with the exception of the specimen mentioned by McCoid and Fritts (1980a), a population of frogs and tadpoles extirpated from ponds near Putah Creek at the University of California at Davis in Yolo County in 1974 (Tinsley and McCoid 1996), and a large population of frogs present in the settling ponds at Edwards Air Force Base in extreme southern Kern County (Jennings, unpublished data). The importation of African clawed frogs into California is now prohibited (California Administrative Code 2004), despite their apparently negligible effect on the present aquatic vertebrate fauna (McCoid and Fritts 1980a, 1980b).

Family RANIDAE—True Frogs.

3. *Rana catesbeiana* Shaw. bullfrog*.

Bullfrogs were first introduced into California in 1896 at Stege [=El Cerrito], Contra Costa County (Jennings and Hayes 1985). The source of the stock was Baltimore, Maryland, and Florida (Heard 1904). From 1912 to 1925 the species was introduced many times with stock obtained from Hawaii, Illinois, Kansas, Louisiana, Missouri, and elsewhere (Storer 1922, 1925; Jennings and Hayes 1985; Storer, unpublished field notes). It was later spread rapidly throughout the state by well-meaning naturalists and

frog farmers and is now established in most areas except high mountains and deserts (Stebbins 1972, Bury and Luckenbach 1976). An important game animal (Treanor and Nicola 1972, Treanor 1975), it was historically abundant enough to allow commercial harvests of approximately 10,000 frogs a year for biological supply companies during the 1970s. Evidence linking bullfrogs to the decline of native frogs, small vertebrates, and other invertebrates in the western United States (e.g., see Schwalbe and Rosen 1988) has resulted in the removal of bag limits for this species in the state.

4. *Rana pipiens* Schreber. northern leopard frog*.

Some uncertainty exists over the native range and genetic make-up of *R. pipiens* populations found in California. The frog is reportedly native east of the Sierra Nevada crest (Bury and Luckenbach 1976, Macey and Papenfuss 1991) and probably introduced into the Lake Tahoe Basin and Modoc County after the turn of the century (Bryant 1917; Storer 1925; Bury and Luckenbach 1976; Jennings 1984; Storer, unpublished field notes). It is known to have been introduced into El Dorado, Imperial, Kern, Los Angeles, Merced, Orange, Riverside, San Francisco, Tehama, and Tulare counties (Storer 1925; Banta and Morafka 1966; Stebbins 1966, 1972, 1985, 2003; Dixon 1967; Moyle 1973; Bury and Luckenbach 1976; Jennings and Fuller 2004). The status of these introduced frog populations was recently examined by Jennings and Fuller (2004) who found that all of these introduced populations appeared to be extinct, except for the population in central Merced County. The leopard frogs found in the Lake Tahoe Basin and northeastern California are definitely *R. pipiens* (Pace 1974) while leopard frogs found elsewhere in the state probably represent a mixture of stocks. Leopard frogs in the Colorado River basin, including the "San Sebastian leopard frog" (Laudenslayer and Grenfell 1983) or the "San Felipe leopard frog" (Drewry 1991) from San Felipe Creek, Imperial County, are actually *R. yavapaiensis* (Platz and Frost 1984). Post-1990 observations of leopard frogs in the lower Colorado River Basin and the Imperial Valley are introduced Rio Grande leopard frogs (see below).

5. *Rana berlandieri* Baird. Rio Grande leopard frog*.

The Rio Grande leopard frog seems to have been accidentally introduced into the lower Colorado River near Yuma, Yuma County, Arizona, via one or more fish plants from either Texas or New Mexico between 1965 and 1971 (Platz et al. 1990). Since 1981, the species has expanded its range and has been taken in agricultural areas along the Colorado River (Clarkson and Rorabaugh 1989) and in the Imperial Valley (Jennings and Hayes 1994b; Jennings and Fuller 2004). This species continues to expand its range in irrigated areas of the Imperial Valley (Jennings, unpublished data).

6. *Rana sphenocephala* Cope. southern leopard frog*.
   6a. *Rana sphenocephala utricularia* Harlan. southern leopard frog*

Jennings and Fuller (2004) speculate that this frog was accidentally introduced (as larvae) into the Chino Gun Club properties in Riverside County during the 1920s with

shipments of bullfrogs, mosquitofish (*Gambusia affinis*), and Louisiana red-swamp crayfish (*Procambarus clarkii*) from dealers in Louisiana. They have since spread within the Santa Ana River Drainage from the Anaheim Hills, Orange County, to Corona, Riverside County, as well as the southwest corner of Irvine Lake in Orange County (Jennings and Fuller 2004). Today, southern leopard frogs are common within the Prado Flood Control Basin in Riverside and San Bernardino counties where they coexist with introduced populations of bullfrogs and African clawed frogs (Jennings and Fuller 2004).

Order Testudines—Turtles.
Family CHELYDRIDAE—Snapping Turtles.

7. *Chelydra serpentina* (Linnaeus). snapping turtle*.
   7a. *Chelydra serpentina serpentina* (Linnaeus). eastern snapping turtle*.

Reported as introduced into California (Pritchard 1979) and established in the vicinity of Fresno, Fresno County (Stebbins 1972). Specimens have been taken in the San Diego River and Sweetwater River, San Diego County (L. J. Bottroff and R. N. Fisher, personal communication), Long Beach, Los Angeles County (L. Swantz, personal communication); Laguna Blanca, Goleta Slough, and Andree Clark Bird Refuge in Santa Barbara County (S. S. Sweet and P. W. Collins, personal communication); Lakewood, Palos Verdes, Castaic Lake, and Edwards Air Force Base, Los Angeles County; Walnut Creek, Contra Costa County; Corte Madera, Marin County; and the Colorado River (Bury and Luckenbach 1976; Jennings, unpublished data). The origin of these populations is probably the result of escaped or released juveniles once kept as pets. The importation of snapping turtles into California is now prohibited (California Administrative Code 2004).

Family EMYDIDAE—Box and Water Turtles.

8. *Trachemys scripta* (Schoepff). slider*.
   8a. *Trachemys scripta elegans* (Wied-Neuwied). red-eared slider*.

Young of this turtle were once widely imported by the pet trade. Although their sale has been greatly curtailed, the species has become well established in many areas of Orange and San Diego counties. Introductions occurred in the area as early as the mid-1930s (Grant 1936). Currently the species is known to be reproducing in the following localities: Upper and Lower Otay, Miramar, El Capitan, Sweetwater, and Poway Reservoirs and the San Diego River, San Diego County (Jennings, unpublished data). The species is also established in several ponds near Long Beach and in Malibu Lake, Los Angeles County (L. Swantz, personal communication; DeLisle et al. 1986); Andree Clark Bird Refuge, Alice Keck Park, Lake Los Carneros, and other localities in Santa Barbara County (S. S. Sweet and P. W. Collins, personal communication); and may be reproducing in ponds near the Pixley National Wildlife Refuge, Tulare County

(D. C. Holland, personal communication); Clear Lake, Lake County, and other areas in the Sacramento-San Joaquin drainage area (especially the San Francisco Bay Area) [Jennings, unpublished data]. There are numerous records of this subspecies in various parts of the state, including Stow Lake, San Francisco County (Banta and Morafka 1966) [with introductions as early as the 1920s (Hanna and Clark 1925)]; Lake Sherwood and Pt. Mugu State Park, Ventura County (LACM 23579, DeLisle et al. 1986); Boronda Lake, Santa Clara County (S. J. Barry, personal communication); and Jewel Lake, Tilden Park, and Walnut Creek, Contra Costa County (Bury and Luckenbach 1976).

Family TRIONYCHIDAE—Softshell Turtles.

9. *Apalone spinifera* (Lesuer). spiny softshell*.
   9a. *Apalone spinifera emoryi* (Agassiz). Texas spiny softshell*.

Probably introduced into the lower Colorado River from New Mexico around 1900 (Dill 1944, Miller 1946, Stebbins 1972). This is supported by the lack of specimens taken (or softshell turtles seen) by early collectors (i.e., Cooper 1863, 1870; Coues 1875; Yarrow 1875; Mearns 1907). Now strongly established in the Colorado River from the International Boundary upstream to Nevada and westward in Imperial County to the Salton Sea. Specimens have also been taken in San Pablo Reservoir, Contra Costa County; the San Gabriel River, Los Angeles County (Bury and Luckenbach 1976); in Santa Barbara, Santa Barbara County (S. S. Sweet, personal communication); and in ponds in the area around Bakersfield and Arvin, Kern County (D. C. Holland, personal communication). The species has recently become established in Lower Otay Reservoir and the San Diego River, San Diego County, from illegally released specimens originating from the Colorado River (L. J. Bottroff, personal communication), as well as San Diego Creek and the Santa Ana River downstream of Prado Dam, Orange County (R. N. Fisher, personal communication), San Gabriel River, Los Angeles County (Jennings, unpublished data), and San Pablo Reservoir, Contra Costa County (Stebbins 2003). This turtle is currently classified as a sport animal (California Fish and Game Commission 2004).

Order Squamata—Lizards and Snakes.
Family GEKKONIDAE—Geckos.

10. *Hemidactylus turcicus* (Linnaeus). Mediterranean house gecko*.
   10a. *Hemidactylus turcicus turcicus* (Linnaeus). Turkish house gecko*.

The Turkish house gecko was first reported from California on May 14, 1988 from the motel and trailer park in Ocotillo, Imperial County by DeLisle (1989). The animals probably originated from introduced populations in Arizona (Robinson and Romack

1973) or the southeastern United States (McCoy 1970). They have since been reported from near Blythe, Cathedral City, Desert Hot Springs, Palm Desert, and Palm Springs in Riverside County; Earp in San Bernardino County; El Centro in Imperial County; and San Diego in San Diego County (Stebbins 2003). These lizards apparently do not survive in natural desert habitats (Jennings, unpublished data), but thrive in and around buildings and other human associated structures in the southern part of the United States (McCoy 1970). This species continues to colonize new areas of the Western Hemisphere after it was first noted in Key West, Florida in 1915 (Stejneger 1922). Its continued spread in towns and cities throughout the desert regions of southern California is to be expected.

11. *Tarentola mauritanica* (Linnaeus). Moorish wall gecko*.

Mahrdt (1998) reported observing a breeding population of 7 adults and 3 hatchlings on 23 September 1997 at a residential neighborhood, 1.5 km south of the El Cajon city limits in San Diego County. These wall geckos are native to southern Europe and the Mediterranean region and are popular pet items. They were apparently introduced sometime before 1995, probably by a local pet shop or by an unknown individual releasing pets. These wall geckos have survived at least two successive winters and their population has expanded 0.2 km from the apparent point of origin. As of Mahrdt's (1998) publication, at least 20 individuals have been observed at a time on residential buildings within this core area. Further expansion of this species within the urban areas of San Diego area is to be expected.

Family COLUBRIDAE—Colubrids.

12. *Nerodia fasciata* (Linnaeus). southern watersnake*.
    12a. *Nerodia fasciata fasciata* (Linnaeus). banded watersnake*.

This snake is now well-established in several aquatic habitats within the vicinity of Lake Natoma, Folsom, Sacramento County (Balfour and Stitt 2002; Jennings, unpublished data). The snakes are reproducing (dozens of individuals seen of all size classes) and have been known at the site for at least 15 years (Balfour and Stitt 2002; J. M. Brode, personal communication). The source of the introduction is unknown, but is probably the result of released pets as southern watersnakes are a common item in the pet trade. The population of snakes in Lake Natoma is currently under study and the California Department of Fish and Game has issued permits for the unlimited capture of this species. To date, no other introduced populations of snakes have been encountered, although there have been unverified reports of southern water snakes seen at several reservoirs within the Bay Area (Jennings, unpublished data).

Introduced Species Unsuccessfully Established or of Questionable Status
Order Caudata—Salamanders.
Family CRYTOBRANCHIDAE—Giant Salamanders and Hellbenders.

1. *Andrias japonicus* (Temminck). Japanese giant salamander*.

Reported by Croker (1942) "to be found in the wild state in the Sacramento Valley." This statement is apparently based upon specimens caught in the wild in the lower Sacramento River and the San Joaquin River at Pittsburg, Contra Costa County, in 1939 (Rodgers, unpublished field notes; Storer, unpublished field notes). The sources of these salamanders were cargo vessels from Japan and other parts of the Orient (Rodgers, unpublished field notes). Other specimens found include one reported by Myers (1951) and another listed by Bury and Luckenbach (1976). Both also appear to be introductions and it is unlikely that the species is established in the state.

Family AMBYSTOMATIDAE—Mole Salamanders and Relatives.

2. *Ambystoma tigrinum* (Green). tiger salamander*.
   2a. *Ambystoma tigrinum diaboli* Dunn. gray tiger salamander*.
   2b. *Ambystoma tigrinum mavortium* Baird. barred tiger salamander*.
   2c. *Ambystoma tigrinum melanostictum* (Baird). blotched tiger salamander*.
   2d. *Ambystoma tigrinum nebulosum* Hallowell. Arizona tiger salamander*.

Larvae of these subspecies (excluding native populations of *A. t. melanostictum* at Grass Valley, Siskiyou County [Shaffer and McKnight 1996]) have been widely introduced during the past 75 years into ponds and reservoirs in the Central Valley, South Coast Range, southern California, the Colorado River basin, and the Salton Sea from various sources for use as live fish bait. Excluding established populations in the state, metamorphosed adults have been observed at Anderson Reservoir, Santa Clara County; China Lake, Kern County; Twentynine Palms, San Bernardino County; the Santa Ana River, Orange and Riverside counties, and scattered locations in San Diego County (Bury and Luckenbach 1976; B. H. Brattstrom, personal communication; Jennings, unpublished data). Adults have also been taken in the city of Yuma, Yuma County, Arizona, on the east side of the Colorado River (Vitt and Ohman 1978). Reproducing populations at these locations are not yet known, but the potential is certainly there, based on stock ponds in counties where this species has become firmly established (see list of introduced established species). Such activities have increased the distribution of this salamander in Arizona (Stebbins 1966, 1985, 2003; Collins 1981). The rearing, transport, and sale of larval tiger salamanders as fish bait is now prohibited (California Administrative Code 2004).

3. *Notophthalmus viridescens* (Rafinesque). eastern newt*.
   3a. *Notophthalmus viridescens viridescens* (Rafinesque). red-spotted newt*.
   3b. *Notophthalmus viridescens louisianensis* (Wotterstorff). central newt*.

Adults of these subspecies of newts are commonly sold in pet stores and the larvae have been sold as fish bait in several localities. Many have escaped or been intentionally released into the wild, but there are no known naturally reproducing populations in the state.

Order Anura—Toads and Frogs.
Family BUFONIDAE—True Toads.

4. *Bufo marinus* (Linnaeus). giant toad*.

Although individuals contemplated introducing this species into California in the mid-1930s to act as a biological control of black widow spiders (*Latrodectus mactans*), apparently no introductions were made (Cowles 1937). However, one individual of this toad was found living in the wild in Ventura County in the 1970s (J. A. St. Amant personal communication). Intensive searches in the surrounding area revealed no other toads. The importation of *B. marinus* into California is prohibited (California Administrative Code 2004).

Order Crocodylia—Crocodilians.
Family ALLIGATORIDAE—Alligators and Caimans.

5. *Alligator mississippiensis* (Daudin). American alligator*.

Escaped alligators imported from the southeastern United States have been reported in the Sacramento-San Joaquin Delta area and the Colorado River. Only one authentic case of a 1.5-m specimen of *A. mississippiensis* found living in the wild in the Delta is known. All other sightings have turned out to be *Caiman crocodilus* (see below). Hock (1954) reported a 3.1-m specimen of *A. mississippiensis* taken in 1943 in the Colorado River that was apparently dumped into the river by a traveling carnival. There apparently was an individual who kept many live alligators for a time in the 1930s at the Santa Fe Railroad Roundhouse in Needles, San Bernardino County, and at least one of these animals ended up being released into the Colorado River where it was eventually killed in Palo Verde Lagoon, Riverside County, on April 30, 1955 (Vitt and Ohmart 1978). Recent records of this species from the Colorado River are lacking and it is highly unlikely that it is established in the state.

6. *Caiman crocodilus* (Linnaeus). spectacled caiman*.

Several subspecies of this crocodilian were widely sold in pet stores prior to 1987. Escaped or liberated caimans have been found living in the wild in the Sacramento San Joaquin Delta area (J. W. Wright, personal communication) and in southern California (Bury and Luckenbach 1976). A live 1.2-m long caiman was found in the Kaweah River near Three Rivers, Tulare County in 1958 and subsequently deposited in the zoology collection at Fresno State University (J. W. Wright, personal communication). The

crocodilian sighted in the Feather River, Sutter County, during the 1980s may have been a spectacled caiman (W. DeJesus, personal communication). There are no known reproducing populations. The importation of all crocodilians is now prohibited by the State of California (California Administrative Code 2004).

Order Testudines—Turtles.
Family CHELYDRIDAE—Snapping Turtles.

7. *Macrochelys temminckii* (Troost, *in* Harlin)[124]. alligator snapping turtle*.

Murphey (1969) recorded a specimen of this species from Sacramento County. The turtle was apparently an escaped pet. No other specimens have been found.

Family EMYDIDAE—Box and Water Turtles.

8. *Chrysemys picta* (Schneider). painted turtle*.
   8a. *Chrysemys picta picta* (Schneider). eastern painted turtle*.
   8b. *Chrysemys picta bellii* (Gray). western painted turtle*.
   8c. *Chrysemys picta dorsalis* Agassiz. southern painted turtle*.
   8d. *Chrysemys picta marginata* Agassiz. midland painted turtle*.

Chrysemys picta bellii was once thought to be native to California, based upon adult specimens observed in the San Francisco fish markets. The turtles probably originated from Oregon and Washington (Van Denburgh 1922). Young and adults of various subspecies of *C. picta*, reported in recent years from the San Francisco area (Banta and Morafka 1966), Los Angeles (Bury and Luckenbach 1976), Goleta (Stebbins 2003), and San Diego (Jennings, unpublished data), were escaped or intentionally released pets. In 1974, 19 specimens of *C. p. bellii* were obtain from a lake in eastern Washington and released in Alamo Creek (just north of Twitchell Reservoir), San Luis Obispo County (S. S. Sweet, personal communication). The present reproductive status of this population, along with another population discovered in 1976 at Kaiser Meadow, Siskiyou County, as reported by Stebbins (1985, 2003), is unknown. Records of juvenile specimens seen at either of these localities have been lacking in recent years.

9. *Graptemys geographica* (LeSueur). northern map turtle*.
10. *Graptemys pseudogeographica* (Gray). false map turtle*.
   10a. *Graptemys pseudogeographica kohnii* (Baur). Mississippi map turtle*.
   10b. *Graptemys pseudogeographica pseudogeographica* (Gray). false map turtle*.
11. *Pseudemys concinna* (Le Conte). river cooter*.
   11a. *Pseudemys concinna concinna* (Le Conte). eastern river cooter*.

[124] Webb (1995) showed that the name *Macrochelys* has precedence over the name *Macroclemys* (*contra* Smith 1955).

11b. *Pseudemys concinna floridana* (Le Conte). coastal plain cooter*.
12. *Trachemys scripta* (Schoepff). slider*.
12a. *Trachemys scripta scripta* (Schoepff). yellow-bellied slider*.
12b. *Trachemys scripta callirostris* (Gray). peacock slider*.
12c. *Trachemys scripta elegans* (Wied-Neuwied). red-eared slider*.

All of the above turtles were once widely imported as young for the pet trade. Many escaped or were intentionally released into the wild, resulting in sporadic sightings in various areas of the state, principally the Central Valley and southern California. None have established known reproducing populations except for *T. s. elegans* (see in list of Introduced Established Species). During the 1980s, several adult cooters and map turtles were trapped in a pond near Long Beach, Los Angeles County (L. Swantz, personal communication), and adult cooters have also been taken in San Diego County (L. J. Bottroff, personal communication). The lack of young individuals at both of these locations, however, tends to support the view that they are not reproducing. Two specimens of *P. s. callirostris*, native to South America, taken in Lower Otay Reservoir, San Diego County, were apparently released pets (L. J. Bottroff, personal communication). The sale of young turtles in California has been effectively curtailed by the Federal Government (U.S. Public Health Service 1972), although adult turtles remain a common item in the pet trade.

13. *Malaclemys terrapin* (Schoepff). diamond-backed terrapin*.
13a. *Malaclemys terrapin terrapin* (Schoepff). northern diamond-backed terrapin*.
13b. *Malaclemys terrapin centrata* (Latreille). Carolina diamond-backed terrapin*.

One hundred and twenty of these turtles were imported from the East Coast of the United States and planted in San Francisco Bay in 1896 (Vogelsang and Gould 1900). Several other attempts have been made to establish this turtle in San Francisco Bay since then (most notably Taft (1944) with 562 individuals from North Carolina), but all have been unsuccessful (Brown 1971). The species is still occasionally encountered in the pet trade, probably the source of turtles reported in Stow Lake (Golden Gate Park), San Francisco County (Banta and Morafka 1966), and Atascadero Creek (Goleta), Santa Barbara County (P. W. Collins, personal communication).

14. *Terrapene carolina* (Linnaeus). eastern box turtle*.
14a. *Terrapene carolina carolina* (Linnaeus). eastern box turtle*.
14b. *Terrapene carolina triunguis* (Agassiz). three-toed box turtle*.
15. *Terrapene ornata* (Agassiz). western box turtle*[125].
15a. *Terrapene ornata ornata* (Agassiz). ornate box turtle*.
15b. *Terrapene ornata luteola* Smith and Ramsey. desert box turtle*.

[125] I use the long standing name "western box turtle" rather than "ornate box turtle" for this species.

Large numbers of these turtles (mainly adults) have been imported into the state for the pet trade. Escaped or released individuals have been encountered in the wild near Almaden, Santa Clara County, in 1938 (Storer, unpublished field notes); above the sea cliffs near La Jolla, San Diego County, in 1947 (Lockley 1948); Richmond and Walnut Creek, Contra Costa County (Bury and Luckenbach 1976; S. J. Barry, personal communication); also in Los Angeles County (Dixon 1967), Ventura County (Jennings, unpublished data), Santa Barbara County (P. W. Collins, personal communication), San Diego County (L. J. Bottroff, personal communication), and the Central Valley (Jennings, unpublished data). Up to 50 individuals yearly were recovered from fields and residential areas of Walnut Creek (Bury and Luckenbach 1976). In spite of the large numbers of individuals in localized areas, there are no known naturally reproducing populations.

Family TESTUDINIDAE—True Land Tortoises.

16. *Geochelone carbonaria* (Spix). red-legged tortoise*.

Six individuals of this tortoise were found during 1972 in fields and yards near Walnut Creek, Contra Costa County (Bury and Luckenbach 1976). They were escaped or released pets.

17. *Gopherus berlandieri* (Agassiz). Texas tortoise*.

Literally thousands of Texas tortoises were imported into California in years prior to protection by the State of Texas in 1979 for the pet trade (Brame and Peerson 1969). Escaped and intentionally released specimens have been encountered in the wild in southern California, the Central Valley, the Central Coast, and the Mojave Desert (Storer, unpublished field notes; P. W. Collins, personal communication; G. R. Stewart, personal communication; Jennings, unpublished data). The release of *G. berlandieri* in desert areas threatens the genetic integrity of native *G. agassizii* populations (Stebbins 1972).

Order Squamata—Lizards and Snakes.
Family GEKKONIDAE—Geckos.

18. *Gehyra mutilata* (Wiegmann). stump-tailed gecko*.

Shaw (1946) reported a single specimen of *Peropus mutilatus* [=*Gehyra mutilata*] on the San Diego Zoo grounds, San Diego County. The lizard was apparently an escapee from the San Diego Zoo Reptile House where four species of Hawaiian geckos were regularly released by Clarence B. Perkins to feed the lizard-eating snakes (Shaw 1946). This record, and another from the San Diego Harbor area, are the apparent basis for Smith and Brodie (1982) reporting this species' occurrence in the vicinity of San Diego. No further specimens have been sighted or captured. James E. Berrian reports

there are no Gehyra in the San Diego Museum of Natural History's collection and, further, that the late James P. Bacon informed him that the winters in the area are probably too cold for the species to survive. However, the possibility of geckos still living in buildings should not be ruled out of the question.

Family AGAMIDAE—Agamid Lizards.

19. *Agama* sp. African rock lizard*.
20. *Zonurus* sp. Merrem. African rock lizard*.

Members of these old world lizard genera have been sold in pet stores in the State. Specimens have been found in the wild in the Los Angeles area (Bury and Luckenbach 1976). There are no reproducing populations.

Family POLYCHRIDAE—Anoles.

21. *Anolis carolinensis* (Voigt). green anole*.

Ronald W. Marlow reported in Bury and Luckenbach (1976) that this species had established a breeding population in Ontario, San Bernardino County. This statement was based on adults, juveniles, and eggs of this species found in the backyard of a house from 1968-1969 (R. W. Marlow, personal communication). The population is now apparently extinct, probably due to sub-zero C temperatures which occur during the winter months (G. R. Stewart, personal communication). The source of introduction was likely released individuals obtained from the nearby Los Angeles County Fairgrounds where anoles were often sold as curios. Green anoles are still occasionally found in residential areas of San Francisco County (Banta and Morafka 1966), and southern California (LACM 131565). All are escaped or intentionally released pets. The species is widely sold at pet stores and carnivals throughout the state.

Family IGUANIDAE—Iguanas and Chuckwallas.

22. *Ctenosaura hemilopha* (Cope). spiny-tailed iguana*.
    22a. *Ctenosaura hemilopha hemilopha* Smith. long-crested spiny iguana*.

Reported by Stebbins (1972) in Fullerton, Orange County. Lizards were originally brought from Sonora, Mexico, to California State University Fullerton, for use in an experiment. A fire destroyed the building in which the lizards were housed and many escaped. Intensive collecting by students and school personnel recaptured all but a few individuals. These last remaining lizards survived for three or four winters, after which the population disappeared (B. H. Brattstrom, personal communication).

23. *Iguana iguana* (Linnaeus). green iguana*.

This species is imported into the United States in very large numbers for the pet trade (Busack 1974). Many have escaped or been intentionally released into the wild. Specimens have been taken in the San Francisco area (Banta and Morafka 1966) and in southern California, especially Los Angeles, Orange, and San Diego counties. There are no known naturally reproducing populations.

Family PHRYNOSOMATIDAE—Zebra-Tailed, Rock, Horned, Spiny, Fringe-toed, Tree, and Side-Blotched Lizards.

24. *Phrynosoma cornutum* (Harlan). Texas horned lizard*.

Escaped or intentionally released pets have been reported in the wild in southern California and in residential areas of San Francisco (Banta and Morafka 1966). There are no known naturally reproducing populations. This reptile was widely sold in pet stores throughout the State prior to protection by the State of Texas in 1979.

25. *Sceloporus cyanogenys* Cope. blue spiny lizard*.

A single specimen of this species was collected in 1970 at the base of the Palms to Pines Highway in Riverside County and deposited in the Natural History Museum of Los Angeles County (LACM 65240) (Stebbins 1972, Bury and Luckenbach 1976). The specimen was apparently an escapee or released captive from a scientific project or personal collection. No other specimens have been collected (B. H. Brattstrom, personal communication).

26. *Sceloporus jarrovii* Cope, *in* Yarrow. Yarrow's spiny lizard*.

A group of these lizards (many of them toe-clipped) were released on a vacant lot in Fullerton, Orange County, during the early 1970s. This population was extirpated 6 months later after the release when a shopping center was built on the site (B. H. Brattstrom, personal communication).

27. *Sceloporus poinsettii* Baird and Girard. crevice spiny lizard*.
    27a. *Sceloporus poinsettii poinsettii* Baird and Girard. northern crevice spiny lizard*.

A single specimen was collected from a residential neighborhood in Northridge, Los Angeles County, during 1980 (LACM 131566). It was an escaped or intentionally released pet.

Family SCINCIDAE—Skinks.

28. *Eumeces obsoletus* (Baird and Girard). Great Plains skink*.

Bury and Luckenbach (1976) reported a specimen in the Los Angeles area. It was apparently an escaped pet.

29. *Tiliqua* sp. Gray. blue-tongued skink*.

Reported by Myers (1951) on the outskirts of San Mateo, San Mateo County. The two skinks were apparently escaped pets.

Family CORDYLIDAE—Girdle-Tailed Lizards

30. *Cordylus giganteus* Smith. sungazer*.

This South American live-bearer is the largest member of the girdle-tailed lizard group. Because of its ferocious appearance (the whole body except for the belly is covered with large heavily-keeled scales), large size, and ability to thrive in captivity, the species is sometimes seen in pet stores (Wynne 1981). One such lizard, apparently a released pet, was captured in Arroyo Seco Canyon, Los Angeles County, in the late 1970s (R. R. Jillson, personal communication). No other specimens have been reported.

Family TEIIDAE—Teiid Lizards

31. *Tupinambis* sp. (Linnaeus). tegu lizard*.

Lizards of this South American genus are widely sold in pet stores throughout the state. Their large size and ability to thrive on chicken eggs makes them a popular pet item. Specimens have been encountered in residential areas of southern California (Bury and Luckenbach 1976), San Francisco (Banta and Morafka 1966), and San Mateo County (Storer, unpublished field notes). All are escaped pets. There are no reproducing populations in the wild.

Family HELODERMATIDAE—Venomous Lizards

32. *Heloderma horridum* (Wiegmann). Mexican beaded lizard*.

Two escaped pets were discovered in the residential areas of Walnut Creek, Contra Costa County (Bury and Luckenbach 1976). No other specimens of this venomous lizard have been reported.

Family VARANIDAE—Monitor Lizards

33. *Varanus exanthematicus* (Daudin). savannah monitor lizard*.

Bury and Luckenbach (1976) reported that a specimen of this lizard was found in Pasadena, Los Angeles County. The specimen was actually taken in June, 1970 in

Altadena, Los Angeles County (S. J. Barry, personal communication). It was an escaped pet.

34. *Varanus salvator* (Laurenti). water monitor lizard*.

A 0.76-m long monitor lizard of this species was caught in Isla Vista, Santa Barbara County, in October, 1978. It is currently in the Biological Sciences laboratory at the University of California at Santa Barbara (S. S. Sweet, personal communication). The lizard was an escaped pet.

Family BOIIDAE—Boas and Pythons.

35. *Corallus caninus* (Linnaeus). emerald tree boa*.

This South American species was occasionally observed in southern California warehouses in the days before banana shipments were routinely gassed on entry into the United States. Two such specimens include one taken in Stockton in 1922 and deposited in the California Academy of Sciences (CAS 8375); and a second captured in Sacramento in 1932 and placed in the collection of the University of California at Davis (Bury and Luckenbach 1976; Storer, unpublished field notes). The species has not been seen in the State for decades.

36. *Boa constrictor* Linnaeus. boa constrictor*.
37. *Corallus enydris* (Linnaeus). tree boa*.
38. *Python molurus* Linnaeus. Indian python*.
39. *Python reticulatus* Schneider. reticulated python*.

The above four species of snakes are frequently sold as pets and there are many reports of escaped specimens in or near residential areas (Bury and Luckenbach 1976; MVZ 8169; Jennings, unpublished data). A *P. m. bivittatus* was even found in the wild near Chilao (elevation 5000 ft.), Angeles National Forest, Los Angeles County, in 1984 (H. F. DeLisle, personal communication). There are no known wild reproducing populations. Many of the snakes observed in the wild probably die during the winter months because of low temperatures (W. DeJesus, personal communication).

Family COLUBRIDAE—Colubrids.

40. *Elaphe guttata* (Linnaeus). red cornsnake*.

A snake of this species reached Berkeley, Contra Costa County, in 1935 in a carload of resin originating in Alabama. The specimen was deposited in the collection of the University of California at Davis (Storer, unpublished field notes).

41. *Drymarchon corais* (Daudin). indigo snake*.
    41a. *Drymarchon corais couperi* (Holbrook). eastern indigo snake*.
42. *Lampropeltis getula* (Linnaeus). common kingsnake.
    42a. *Lampropeltis getula floridana* Blanchard. Florida kingsnake*.

Specimens of these two species, both native to the eastern United States, were reported by Bury and Luckenbach (1976) in Los Angeles County. They were found "dead on road" in La Cañada in June, 1969 and Altadena in May, 1970 (S. J. Barry, personal communication). All were escaped pets. There are no known reproducing populations.

43. *Nerodia sipedon* (Linnaeus). northern water snake*.
    43a. *Nerodia sipedon sipedon* (Linnaeus). common water snake*.

One young specimen was collected from El Dorado Park, Los Angeles County, and given to the Natural History Museum of Los Angeles County in 1974 (LACM 109564). The snake is probably the result of a released pregnant female. No other specimens have been found.

44. *Leptodeira annulata* (Linnaeus). cat-eyed snake*.

Repeatedly reported from San Francisco warehouses before the practice of routinely gassing banana shipments (Banta and Morafka 1966). The species has not been seen in California for decades.

45. *Thamnophis sauritus* (Linnaeus). eastern ribbonsnake*.

About 60 ribbon snakes from an exhibit at the California State Fair (source unknown) were reported to have been liberated near Livermore, Alameda County, in 1935 (Storer, unpublished field notes). No specimens have been reported since this introduction and it is highly unlikely that the species is established in the state.

46. *Opheodrys aestivus* (Linnaeus). rough greensnake*.

A single live adult snake was caught on the east side of Lake Los Carnos (Goleta), Santa Barbara County, and donated to the Santa Barbara Museum of Natural History (P. W. Collins, personal communication). No other specimens have been reported. The snake apparently was an escaped or released pet.

Family ELAPIDAE—Coral Snakes and Seasnakes.

47. *Naja haje* (Linnaeus). Egyptian cobra*.

The reports of "cobras" liberated in the rice fields of the Sacramento Valley during the 1930s by Hindu farmers are baseless (Storer, unpublished field notes). However, Sean J. Barry reported collecting a specimen of this species in Pasadena, Los Angeles County (Bury and Luckenbach 1976). The snake was captured with difficulty in a front yard on Altadena Boulevard in May, 1970 and delivered to the Eaton Canyon Nature Center (S. J. Barry, personal communication). No other specimens have been reported in recent years. The discovery of this highly venomous snake in a heavily populated residential area points out the problem of the public illegally keeping dangerous exotic reptiles in private collections.

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